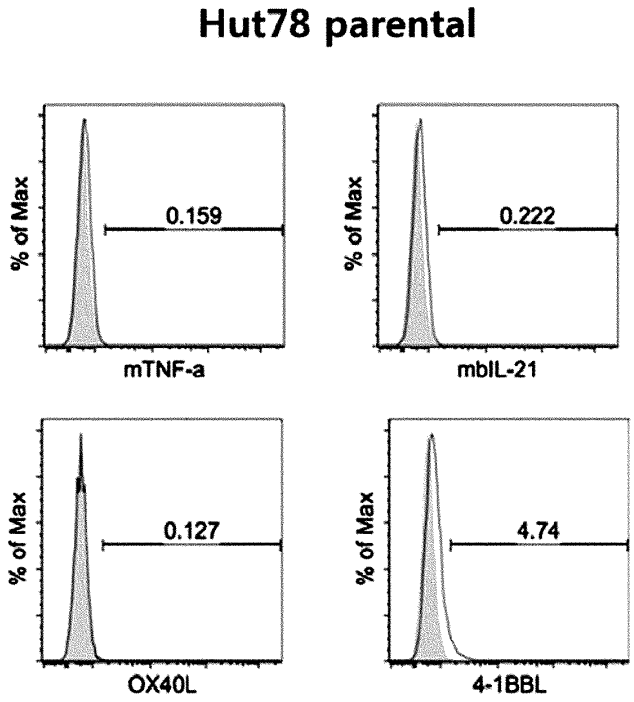
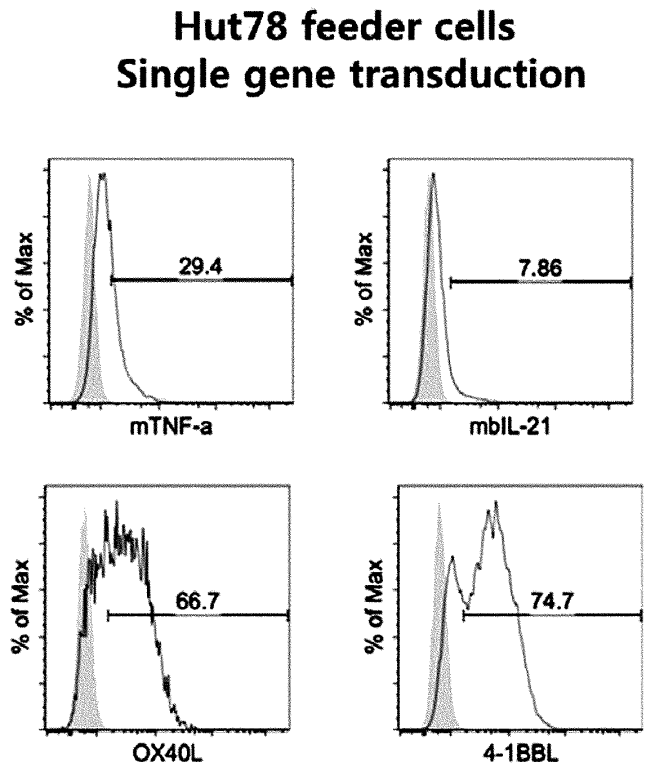
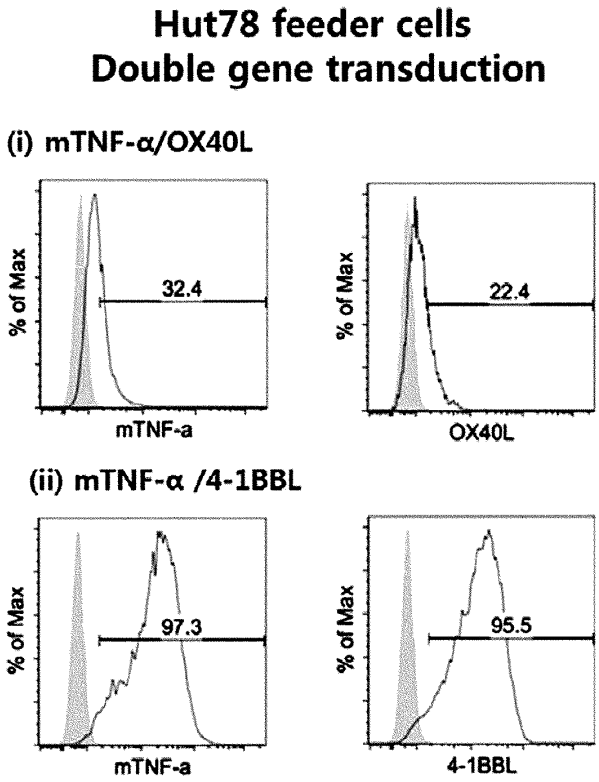
[도1a]


Hut78 parental
% of Max
0.159
mTNF-a
% of Max
0.222
mbIL-21
% of Max
0.127
OX40L
% of Max
4.74
4-1BBL

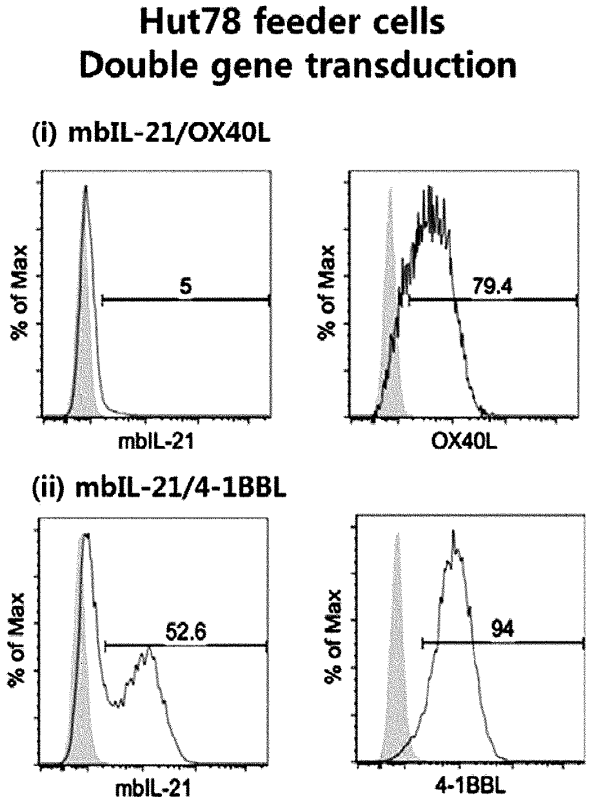
[도1b]


Hut78 feeder cells
Single gene transduction
% of Max
29.4
mTNF-a
% of Max
7.86
mbIL-21
% of Max
66.7
OX40L
% of Max
74.7
4-1BBL

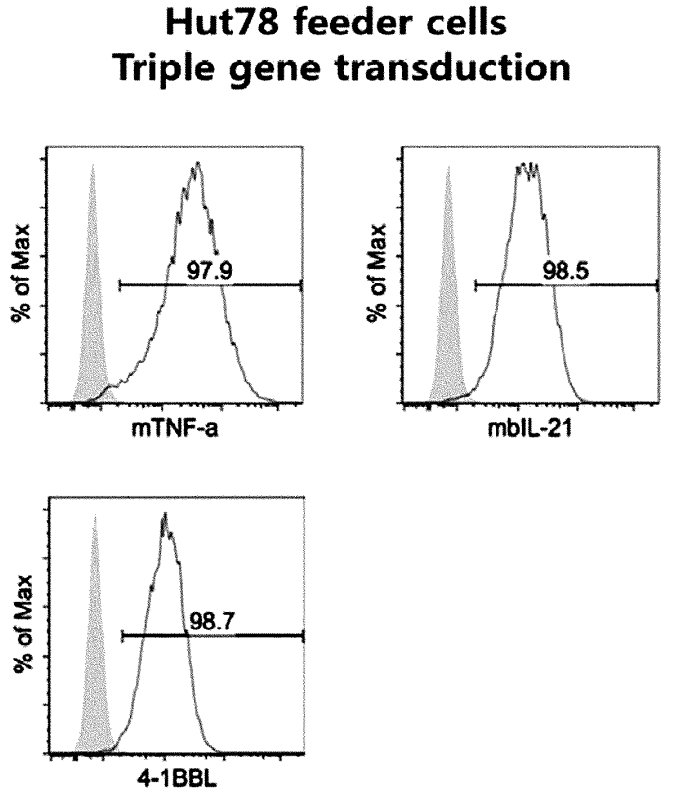
[도1c]


Hut78 feeder cells
Double gene transduction
(i) mTNF-α/OX40L
% of Max
32.4
mTNF-a
% of Max
22.4
OX40L
(ii) mTNF-α /4-1BBL
% of Max
97.3
mTNF-a
% of Max
95.5
4-1BBL

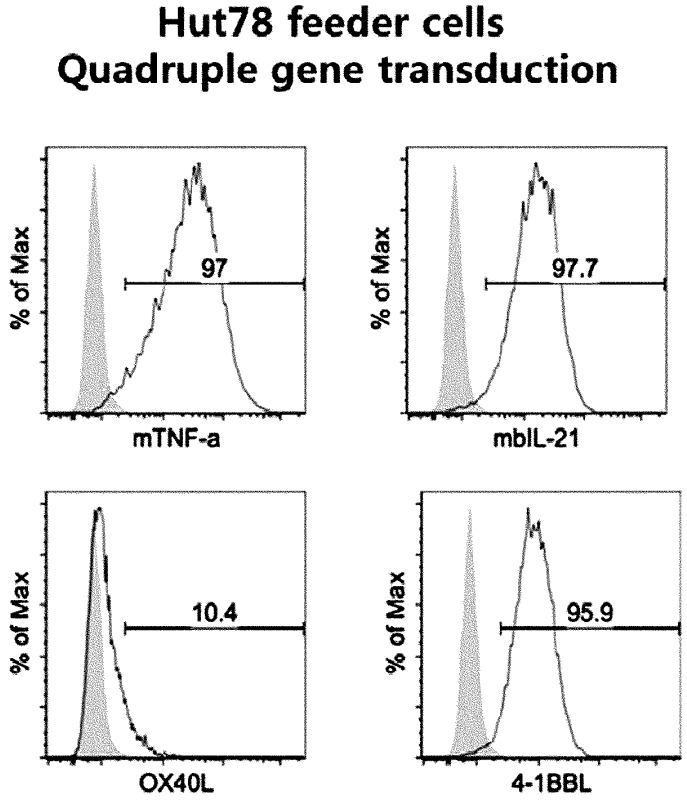
[도1d]


Hut78 feeder cells
Double gene transduction
(i) mbIL-21/OX40L
% of Max
5
mbIL-21
% of Max
79.4
OX40L
(ii) mbIL-21/4-1BBL
% of Max
52.6
mbIL-21
% of Max
94
4-1BBL

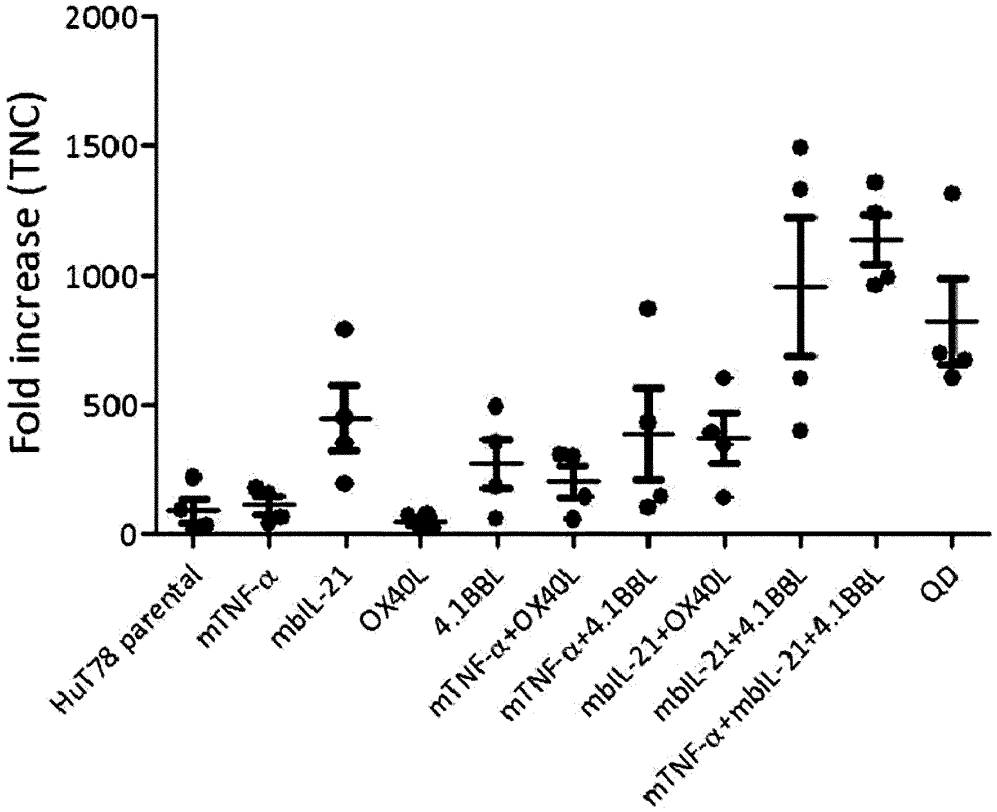
[도1e]


Hut78 feeder cells
Triple gene transduction
% of Max
97.9
mTNF-a
% of Max
98.5
mbIL-21
% of Max
98.7
4-1BBL

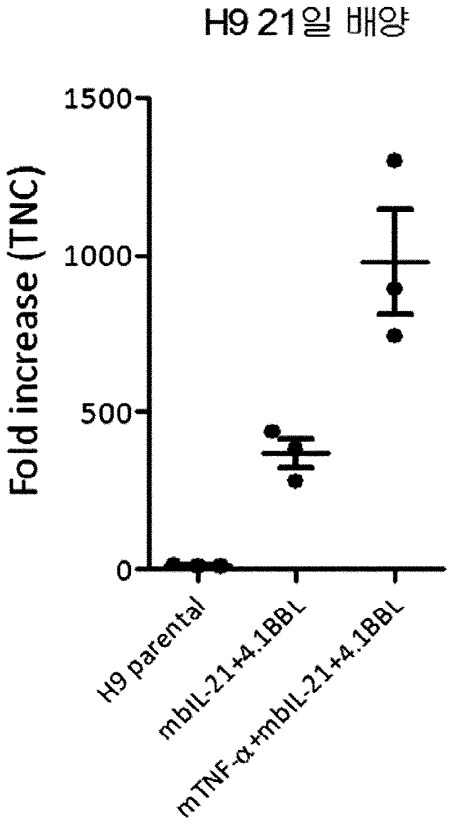
[도1f]


Hut78 feeder cells
Quadruple gene transduction
% of Max
97
mTNF-a
% of Max
97.7
mbIL-21
% of Max
10.4
OX40L
% of Max
95.9
4-1BBL

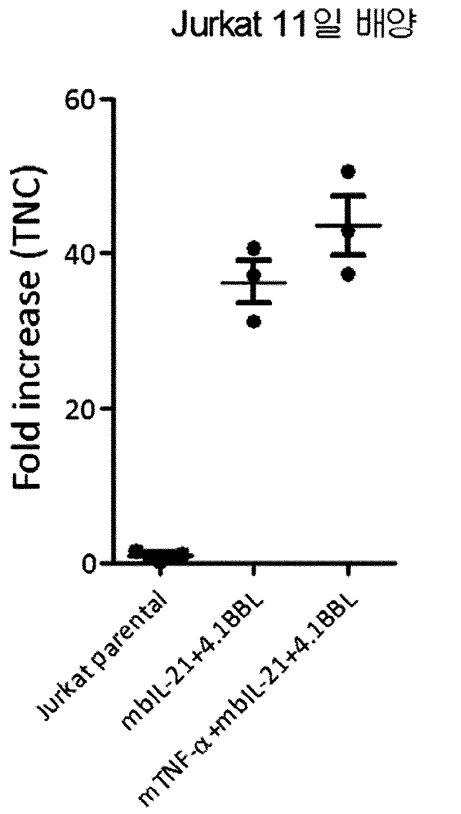
[도2a]


Fold increase (TNC)
2000
1500
1000
500
0
HuT78 parental
mTNF-α
mbIL-21
OX40L
4.1BBL
mTNF-α+OX40L
mTNF-α+4.1BBL
mbIL-21+OX40L
mbIL-21+4.1BBL
mTNF-α+mbIL-21+4.1BBL
QD

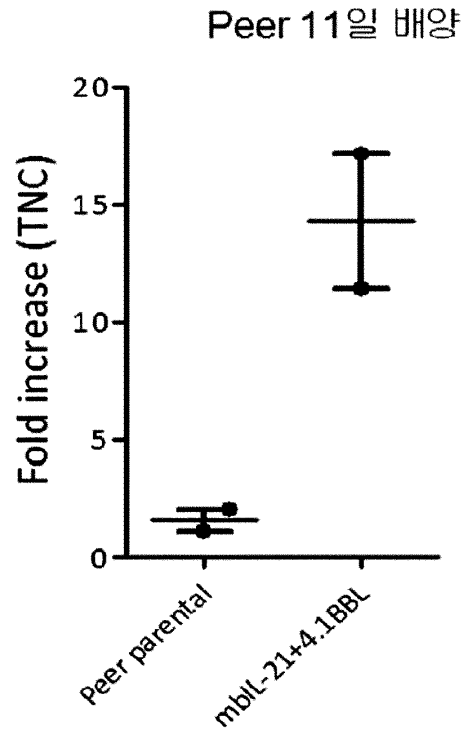
[도2b]


H9 21일 배양
Fold increase (TNC)
1500
1000
500
0
H9 parental
mbIL-21+4.1BBL
mTNF-α+mbIL-21+4.1BBL

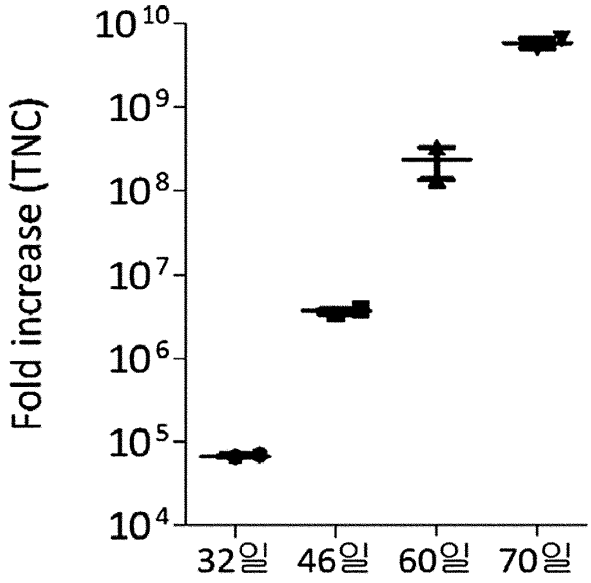
[도2c]


Jurkat 11일 배양
Fold increase (TNC)
60
40
20
0
Jurkat parental
mbIL-21+4.1BBL
mTNF-α+mbIL-21+4.1BBL

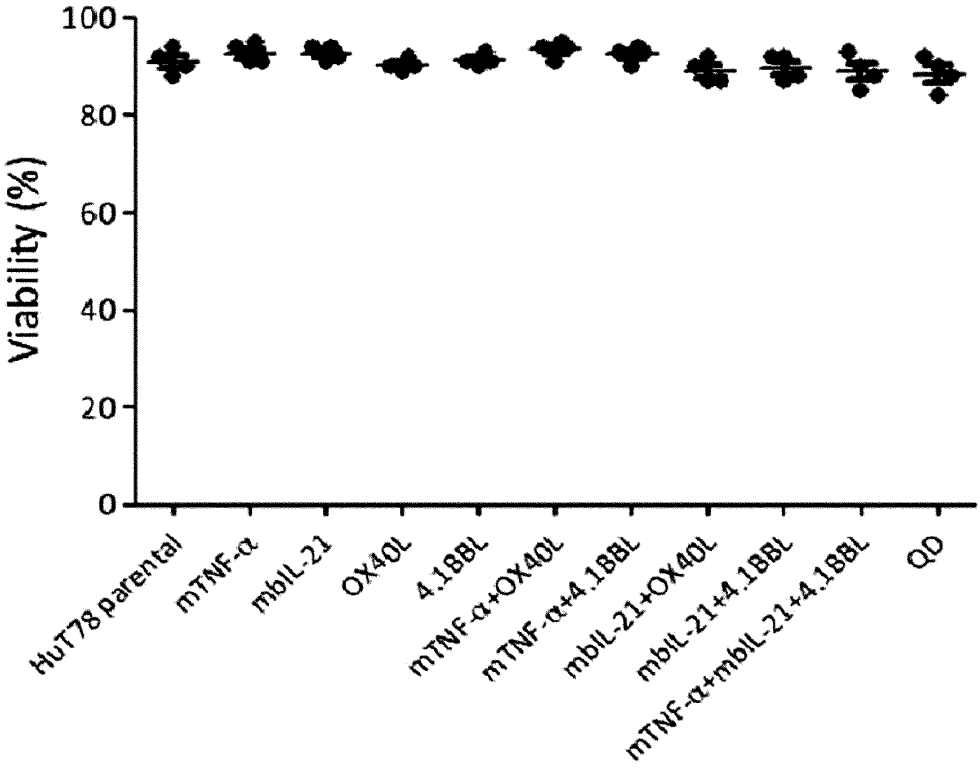
[도2d]


Peer 11일 배양
Fold increase (TNC)
20
15
10
5
0
Peer parental
mbIL-21+4.1BBL

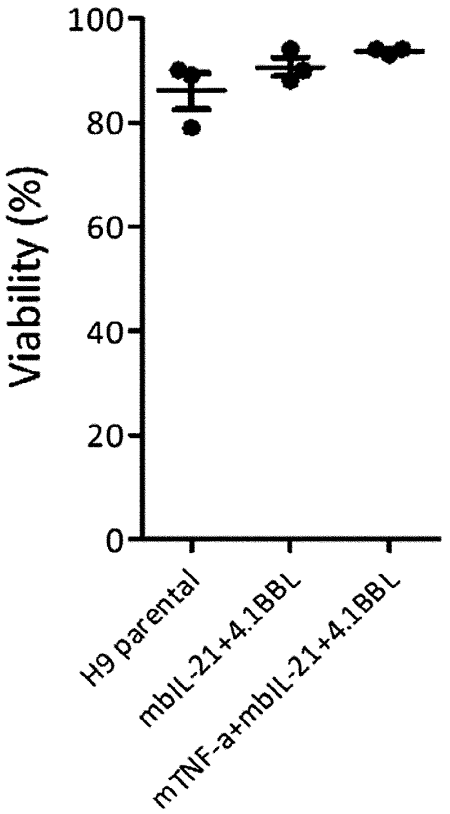
[도2e]


Fold increase (TNC)
10^{10}
10^{9}
10^{8}
10^{7}
10^{6}
10^{5}
10^{4}
32일
46일
60일
70일

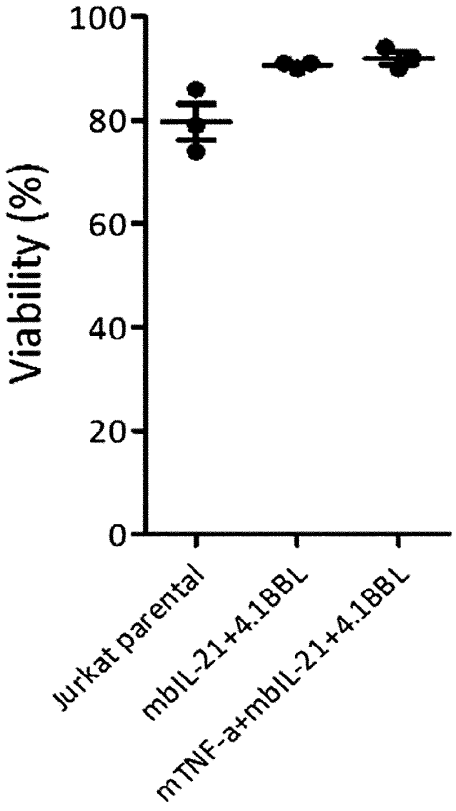
[도3a]


Viability (%)
100
80
60
40
20
0
HuT78 parental
mTNF-α
mbIL-21
OX40L
4.1BBL
mTNF-α+OX40L
mTNF-α+4.1BBL
mbIL-21+OX40L
mbIL-21+4.1BBL
mTNF-α+mbIL-21+4.1BBL
QD

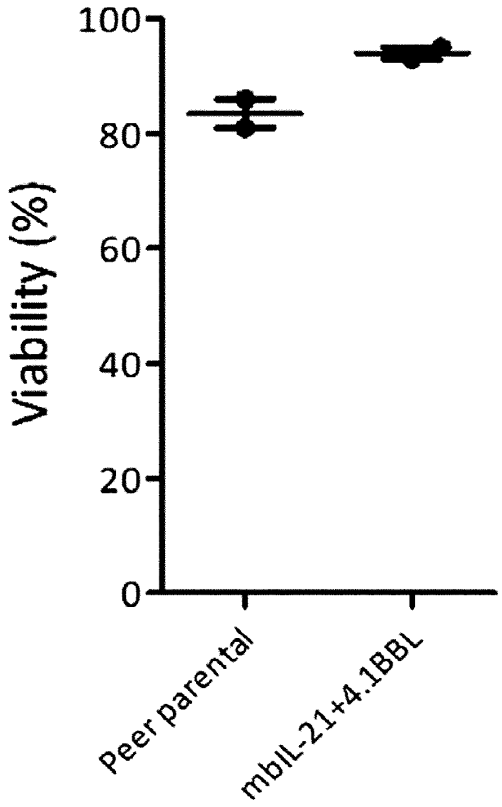
[도3b]


100
80
60
40
20
0
Viability (%)
H9 parental
mbIL-21+4.1BBL
mTNF-a+mbIL-21+4.1BBL

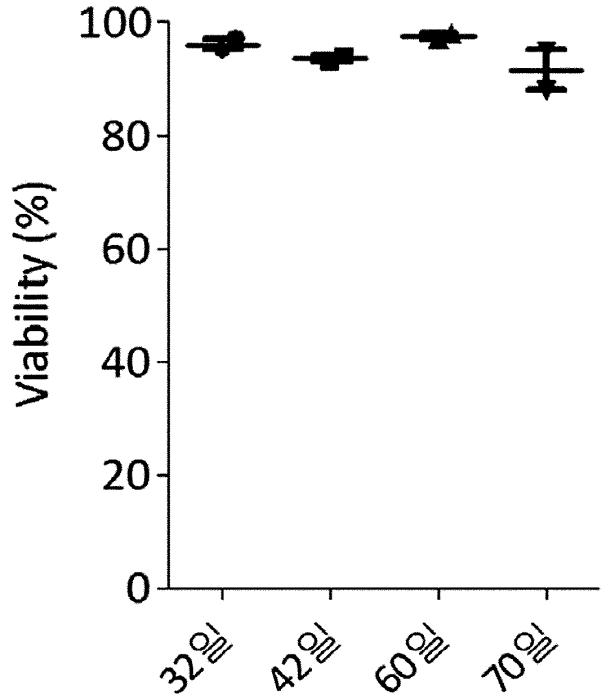
[도3c]


100
80
60
40
20
0
Viability (%)
Jurkat parental
mbIL-21+4.1BBL
mTNF-a+mbIL-21+4.1BBL

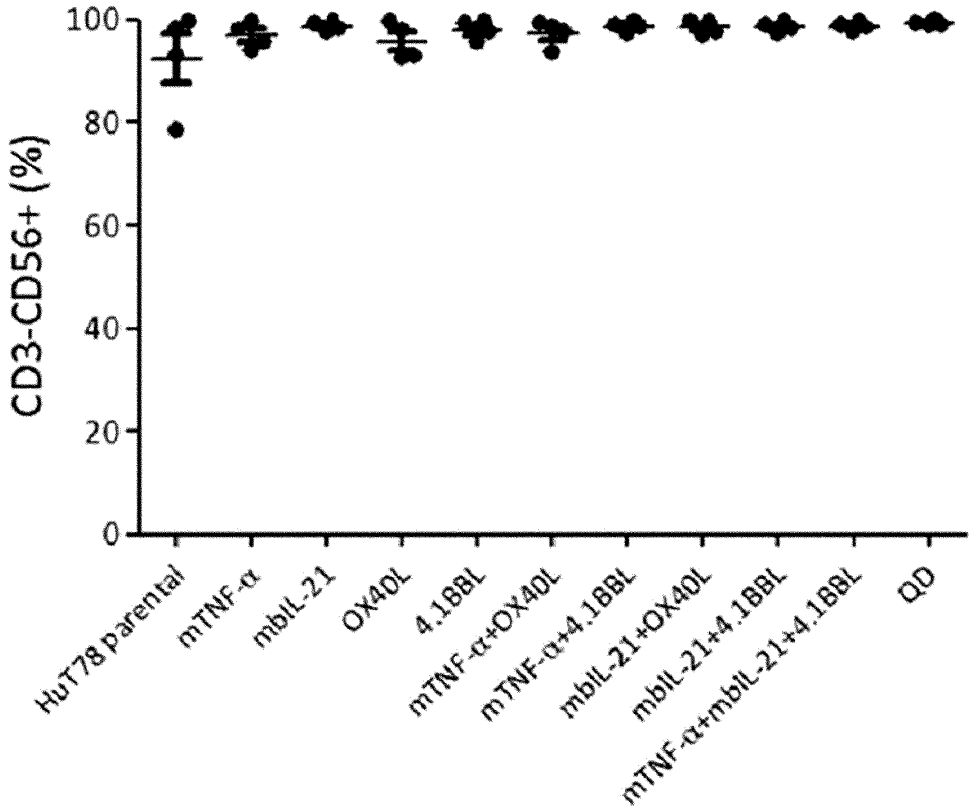
[도3d]


100
80
60
40
20
0
Viability (%)
Peer parental
mbIL-21+4.1BBL

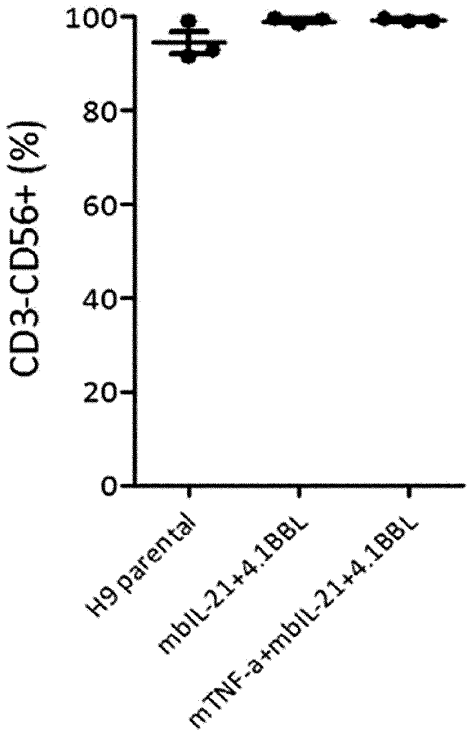
[도3e]


100
80
60
40
20
0
Viability (%)
32일
42일
60일
70일

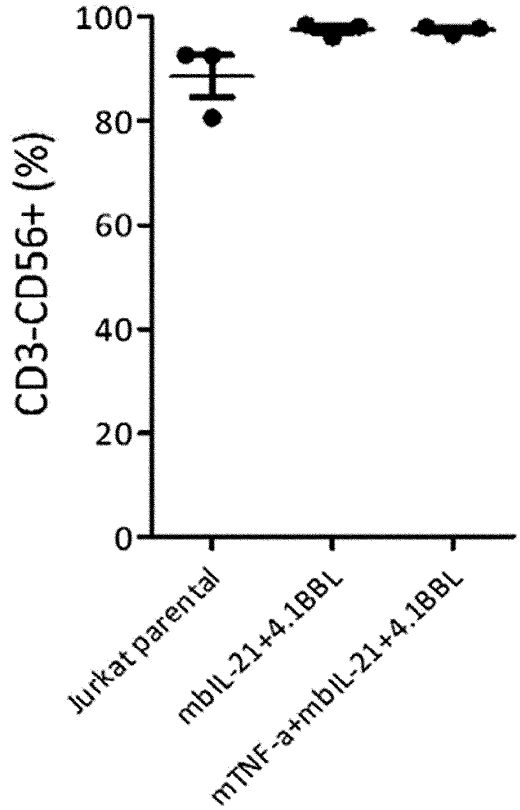
[도4a]


CD3-CD56+ (%)
100
80
60
40
20
0
HuT78 parental
mTNF-α
mbIL-21
OX40L
4.1BBL
mTNF-α+OX40L
mTNF-α+4.1BBL
mbIL-21+OX40L
mbIL-21+4.1BBL
mTNF-α+mbIL-21+4.1BBL
QD

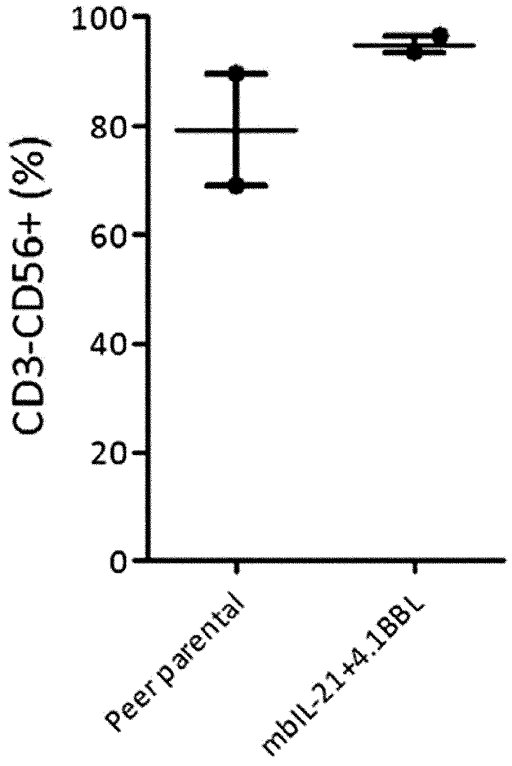
[도4b]


CD3-CD56+ (%)
100
80
60
40
20
0
H9 parental
mbIL-21+4.1BBL
mTNF-a+mbIL-21+4.1BBL

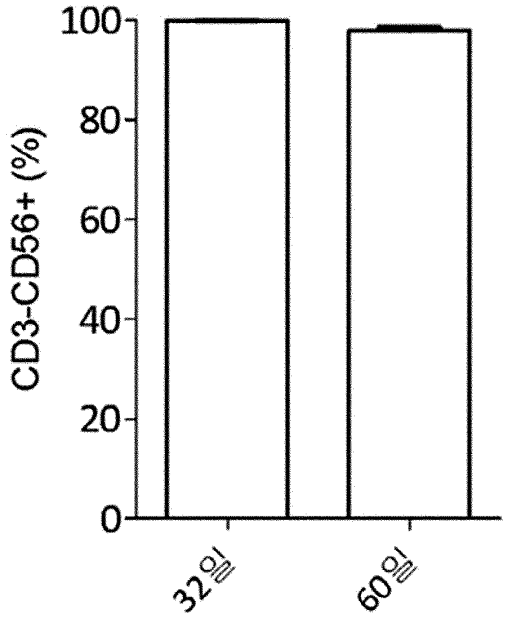
[도4c]


100
80
60
40
20
0
CD3-CD56+ (%)
Jurkat parental
mbIL-21+4.1BBL
mTNF-a+mbIL-21+4.1BBL

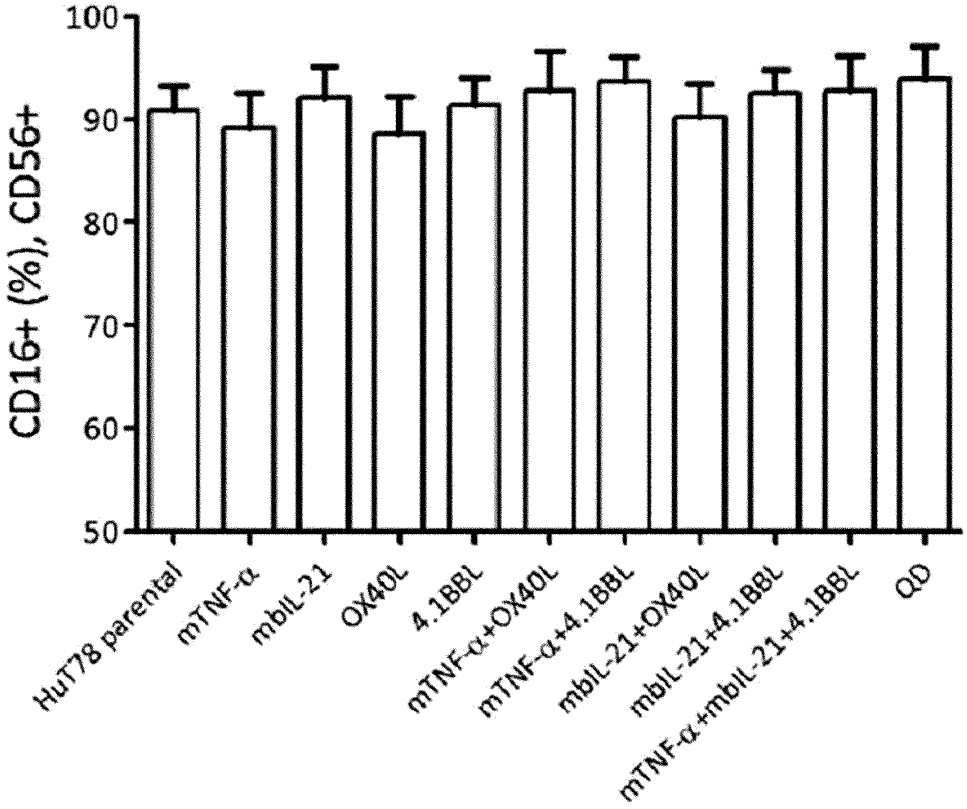
[도4d]


100
80
60
40
20
0
CD3-CD56+ (%)
Peer parental
mbIL-21+4.1BBL

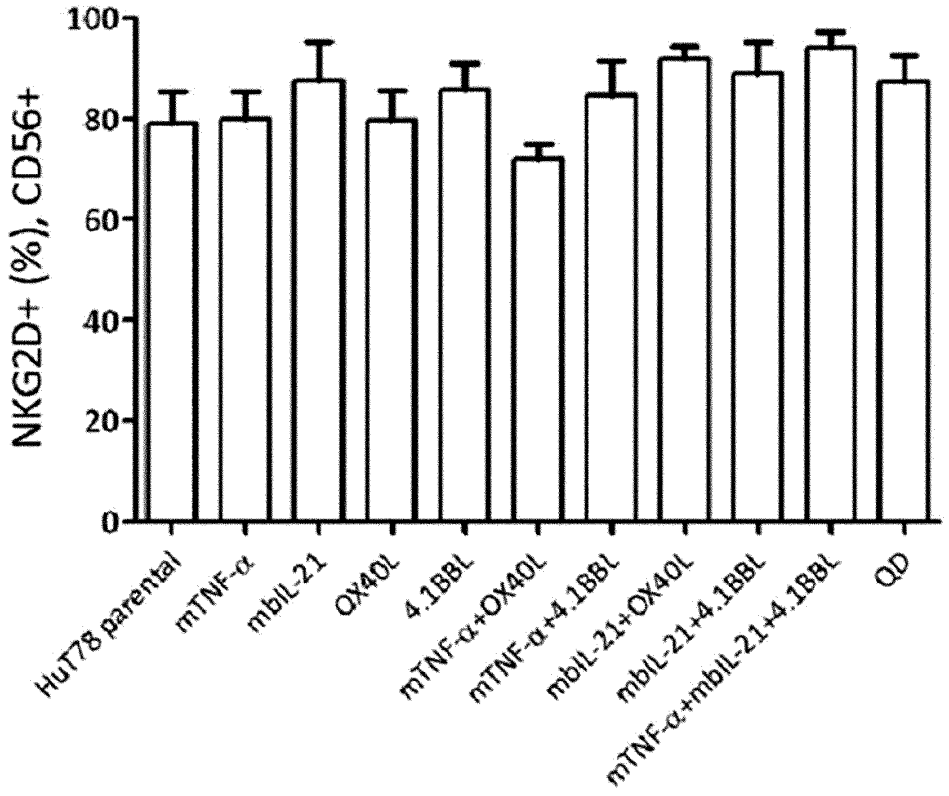
[도4e]


CD3-CD56+ (%)
100
80
60
40
20
0
32일
60일

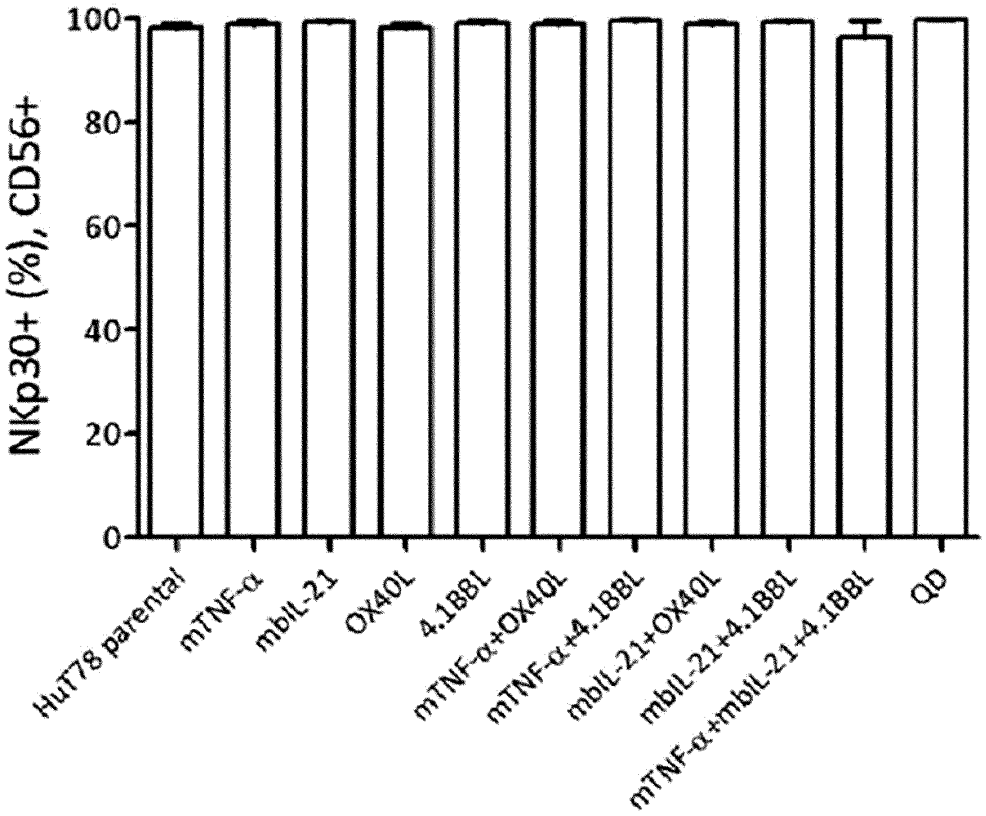
[도5a]


CD16+ (%), CD56+
100
90
80
70
60
50
HuT78 parental
mTNF-α
mbIL-21
OX40L
4.1BBL
mTNF-α+OX40L
mTNF-α+4.1BBL
mbIL-21+OX40L
mbIL-21+4.1BBL
mTNF-α+mbIL-21+4.1BBL
QD

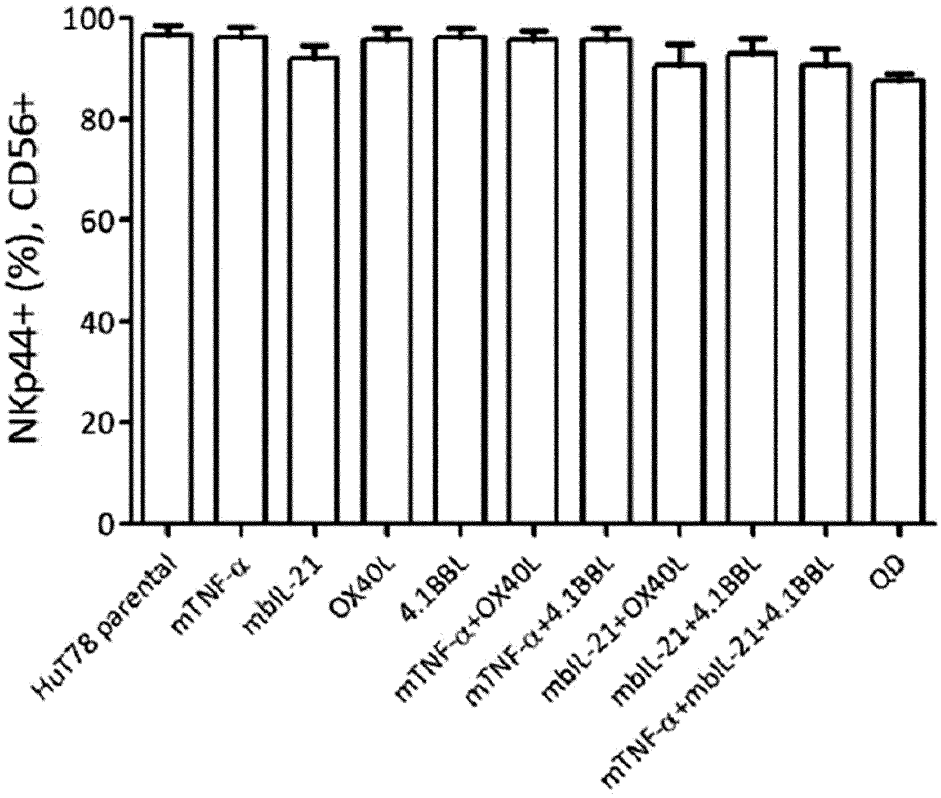
[도5b]


NKG2D+ (%), CD56+
100
80
60
40
20
0
HuT78 parental
mTNF-α
mbIL-21
OX40L
4.1BBL
mTNF-α+OX40L
mTNF-α+4.1BBL
mbIL-21+OX40L
mbIL-21+4.1BBL
mTNF-α+mbIL-21+4.1BBL
QD

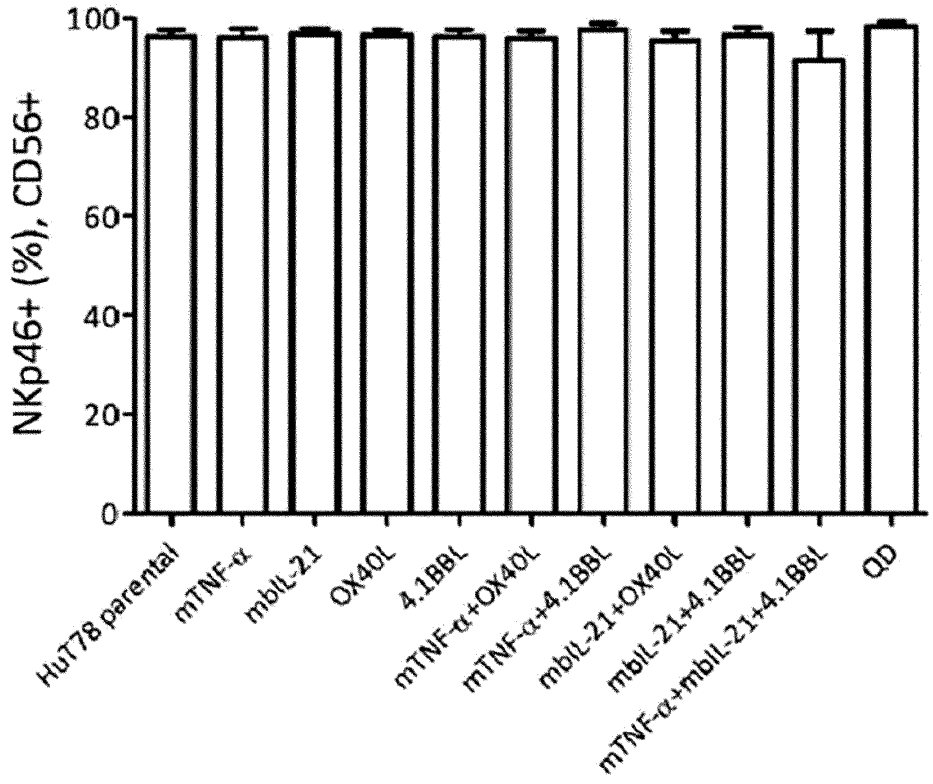
[도5c]


NKp30+ (%), CD56+
100
80
60
40
20
0
HuT78 parental
mTNF-α
mbIL-21
OX40L
4.1BBL
mTNF-α+OX40L
mTNF-α+4.1BBL
mbIL-21+OX40L
mbIL-21+4.1BBL
mTNF-α+mbIL-21+4.1BBL
QD

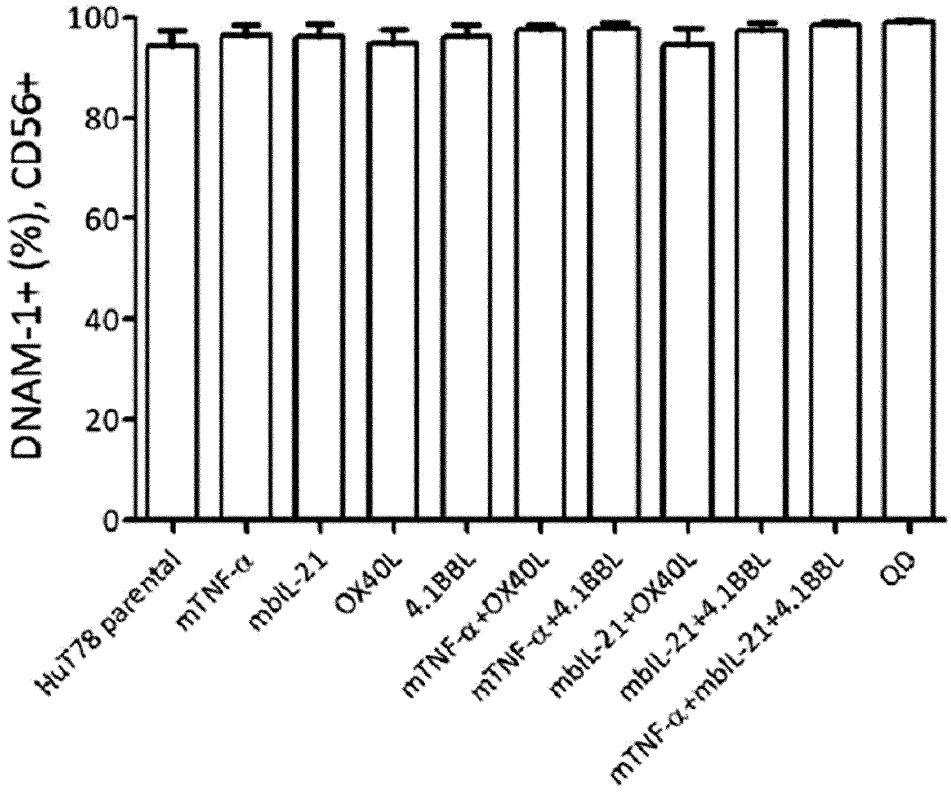
[도5d]


NKp44+ (%), CD56+
100
80
60
40
20
0
HuT78 parental
mTNF-α
mbIL-21
OX40L
4.1BBL
mTNF-α+OX40L
mTNF-α+4.1BBL
mbIL-21+OX40L
mbIL-21+4.1BBL
mTNF-α+mbIL-21+4.1BBL
QD

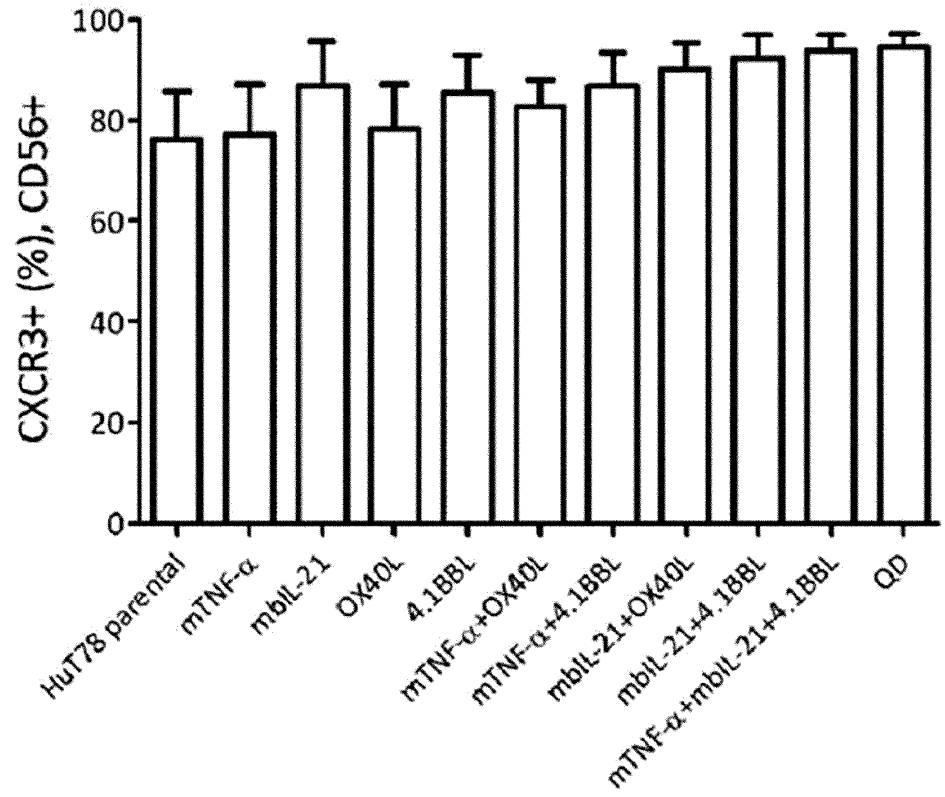
[도5e]


NKp46+ (%), CD56+
100
80
60
40
20
0
HuT78 parental
mTNF-α
mbIL-21
OX40L
4.1BBL
mTNF-α+OX40L
mTNF-α+4.1BBL
mbIL-21+OX40L
mbIL-21+4.1BBL
mTNF-α+mbIL-21+4.1BBL
QD

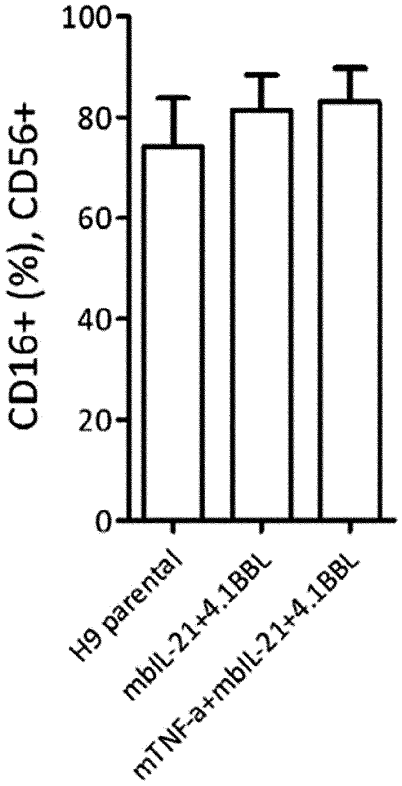
[도5f]


DNAM-1+ (%), CD56+
100
80
60
40
20
0
HuT78 parental
mTNF-α
mbIL-21
OX40L
4.1BBL
mTNF-α+OX40L
mTNF-α+4.1BBL
mbIL-21+OX40L
mbIL-21+4.1BBL
mTNF-α+mbIL-21+4.1BBL
QD

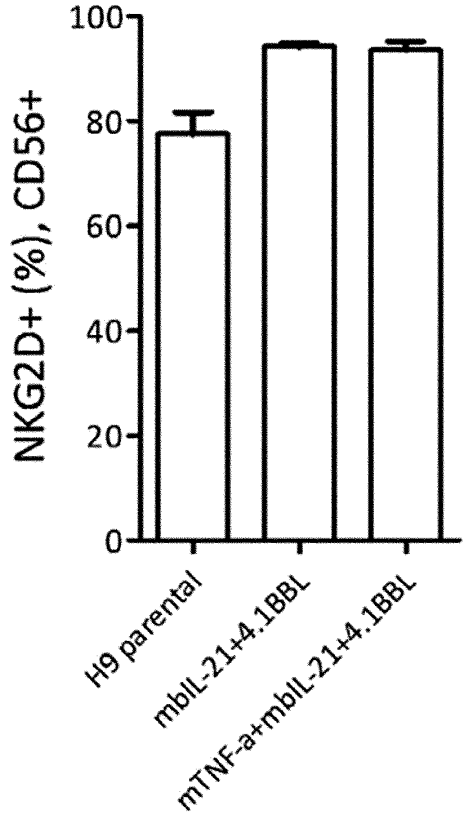
[도5g]


CXCR3+ (%), CD56+
100
80
60
40
20
0
HuT78 parental
mTNF-α
mbIL-21
OX40L
4.1BBL
mTNF-α+OX40L
mTNF-α+4.1BBL
mbIL-21+OX40L
mbIL-21+4.1BBL
mTNF-α+mbIL-21+4.1BBL
QD

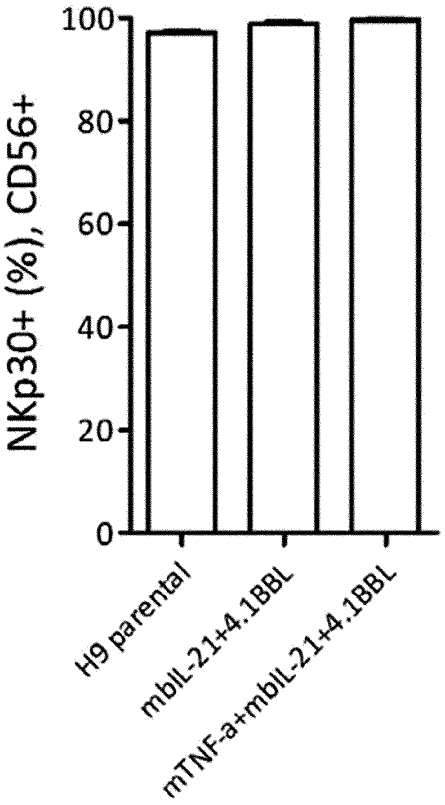
[도6a]


CD16+ (%), CD56+
100
80
60
40
20
0
H9 parental
mbIL-21+4.1BBL
mTNF-a+mbIL-21+4.1BBL

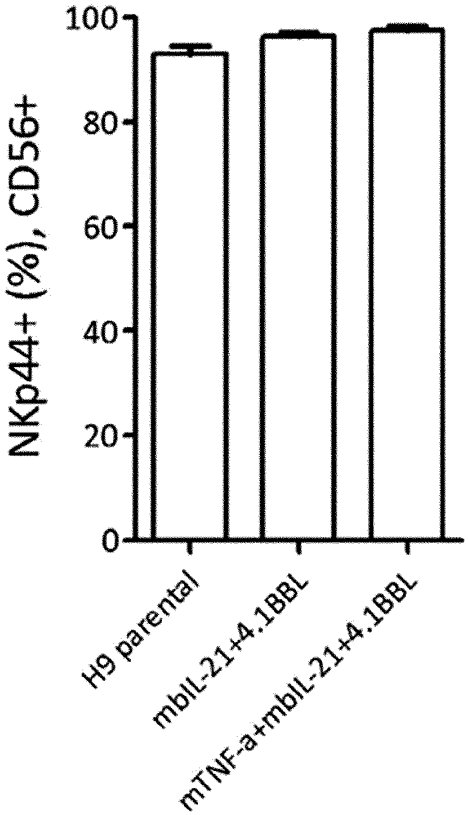
[도6b]


NKG2D+ (%), CD56+
100
80
60
40
20
0
H9 parental
mbIL-21+4.1BBL
mTNF-a+mbIL-21+4.1BBL

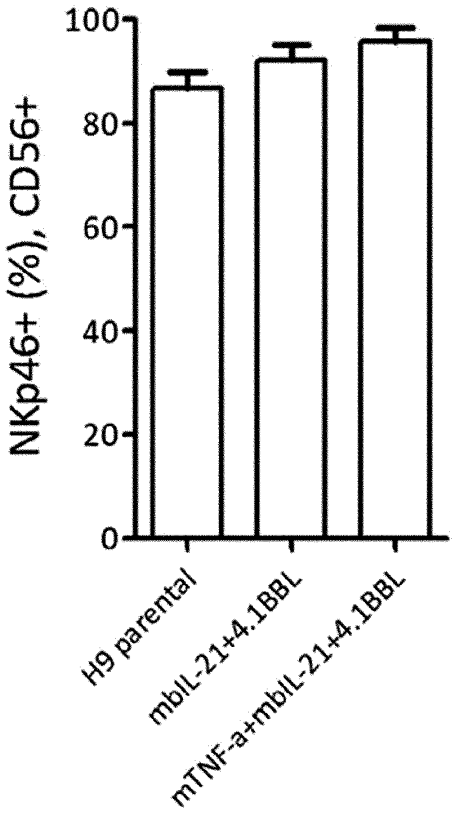
[도6c]


NKp30+ (%), CD56+
100
80
60
40
20
0
H9 parental
mbIL-21+4.1BBL
mTNF-a+mbIL-21+4.1BBL

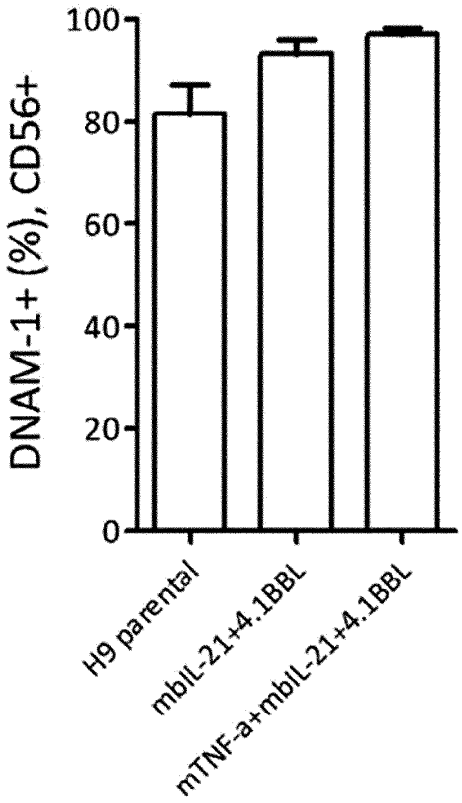
[도6d]


NKp44+ (%), CD56+
100
80
60
40
20
0
H9 parental
mbIL-21+4.1BBL
mTNF-a+mbIL-21+4.1BBL

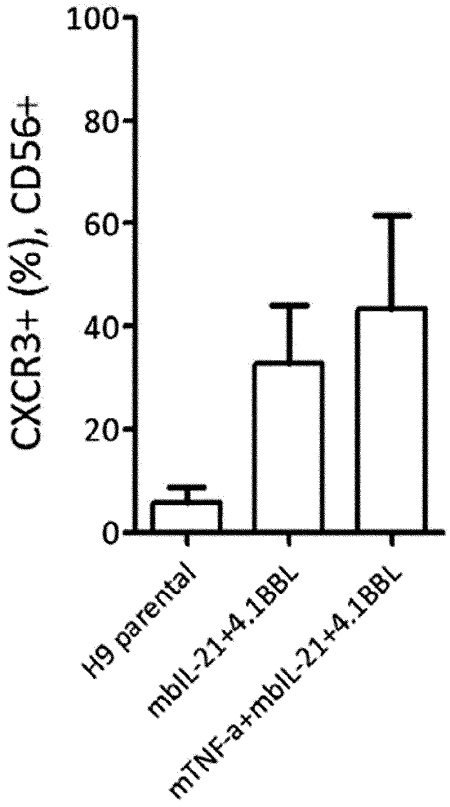
[도6e]


NKp46+ (%), CD56+
100
80
60
40
20
0
H9 parental
mbIL-21+4.1BBL
mTNF-a+mbIL-21+4.1BBL

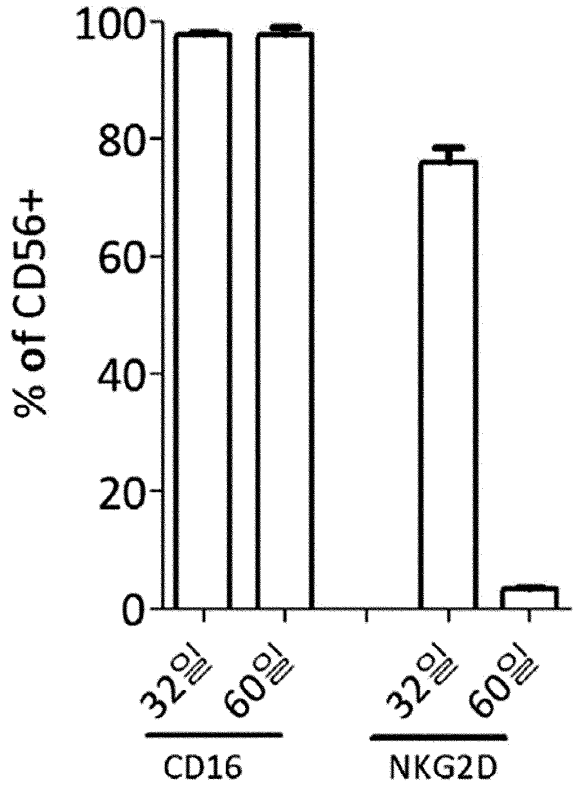
[도6f]


DNAM-1+ (%), CD56+
100
80
60
40
20
0
H9 parental
mbIL-21+4.1BBL
mTNF-a+mbIL-21+4.1BBL

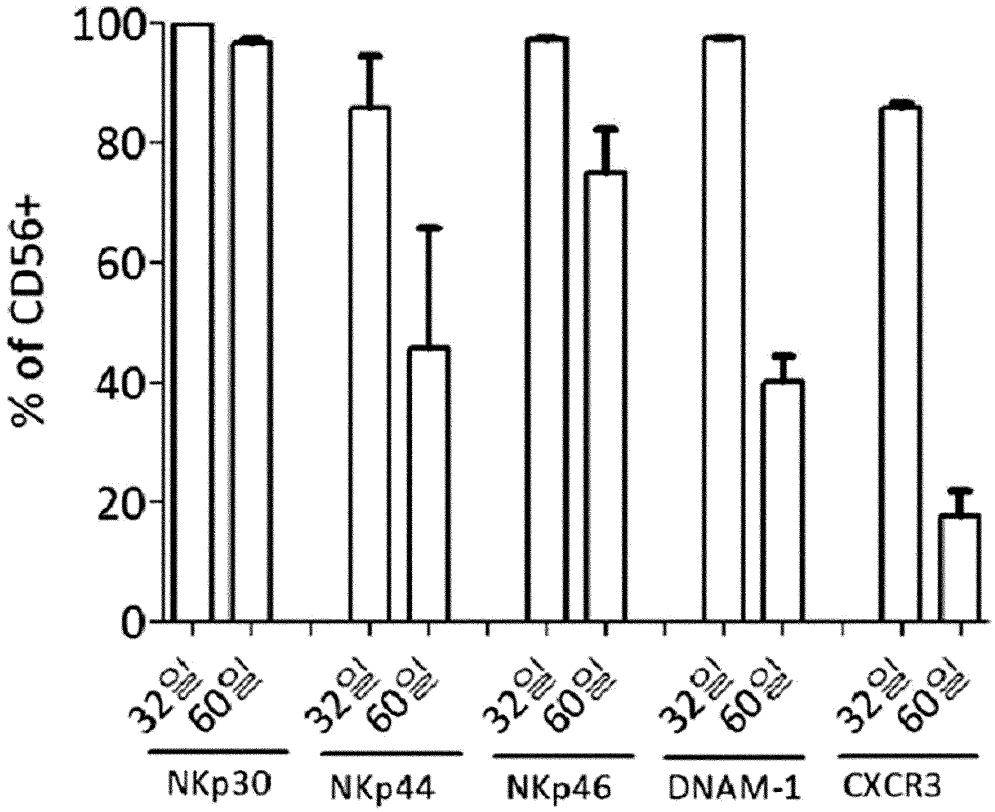
[도6g]


CXCR3+ (%), CD56+
100
80
60
40
20
0
H9 parental
mbIL-21+4.1BBL
mTNF-a+mbIL-21+4.1BBL

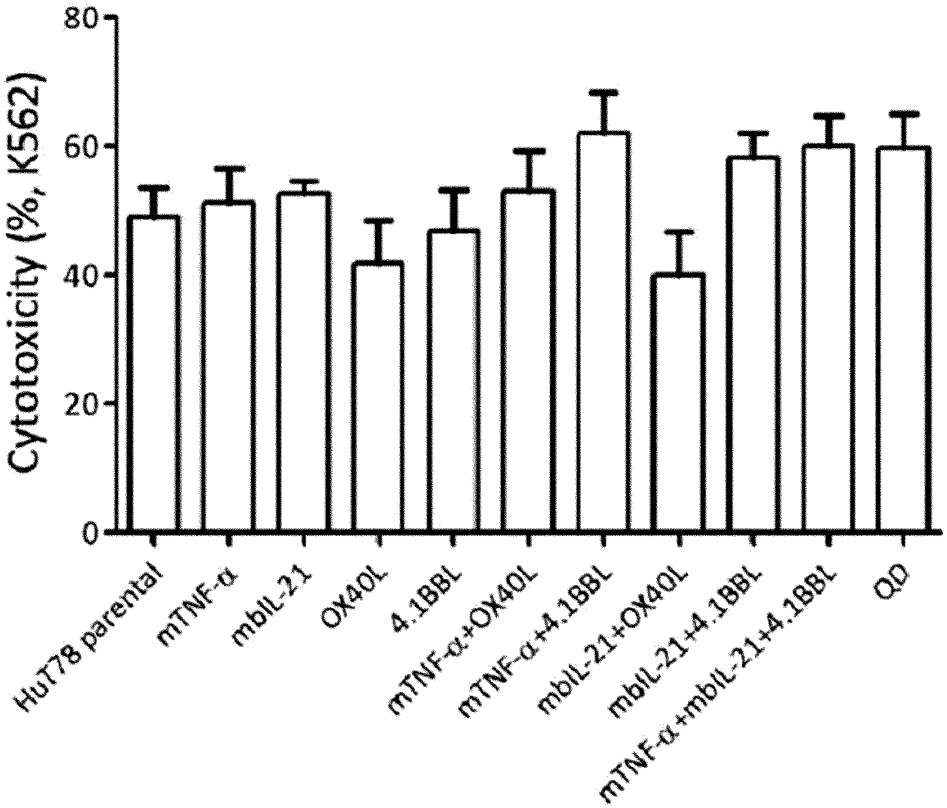
[도7a]


% of CD56+
100
80
60
40
20
0
32일
60일
32일
60일
CD16
NKG2D

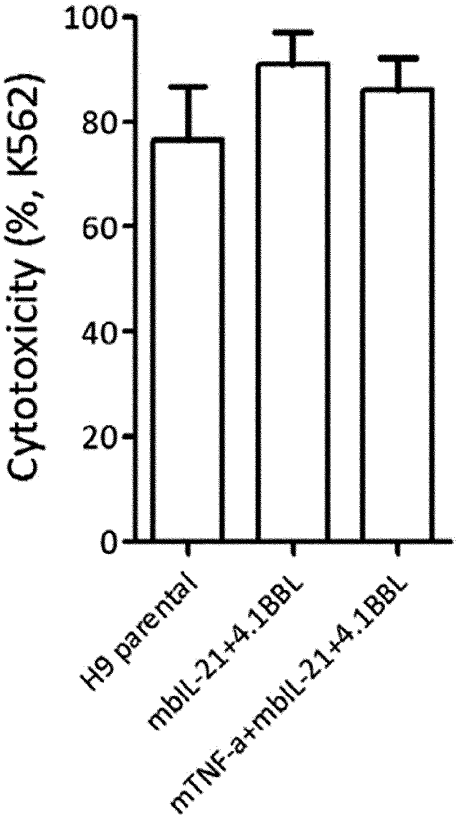
[도7b]


100
80
60
40
20
0
% of CD56+
32℃
60℃
NKp30
NKp44
NKp46
DNAM-1
CXCR3

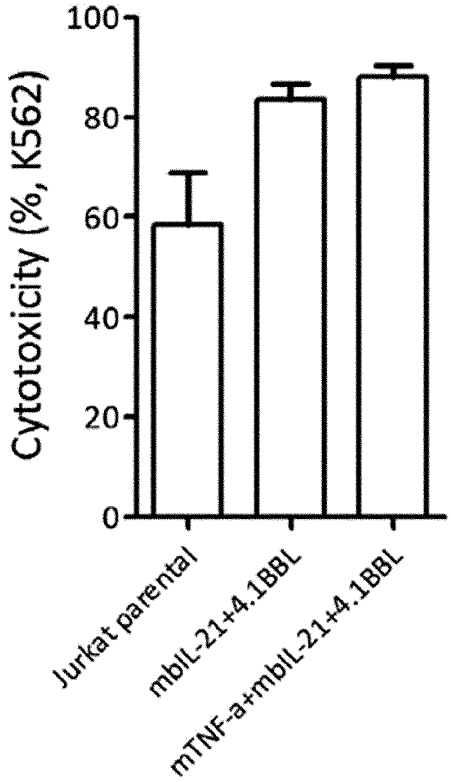
[도8a]


80
60
40
20
0
Cytotoxicity (%, K562)
HuT78 parental
mTNF-α
mbIL-21
OX40L
4.1BBL
mTNF-α+OX40L
mTNF-α+4.1BBL
mbIL-21+OX40L
mbIL-21+4.1BBL
mTNF-α+mbIL-21+4.1BBL
QD

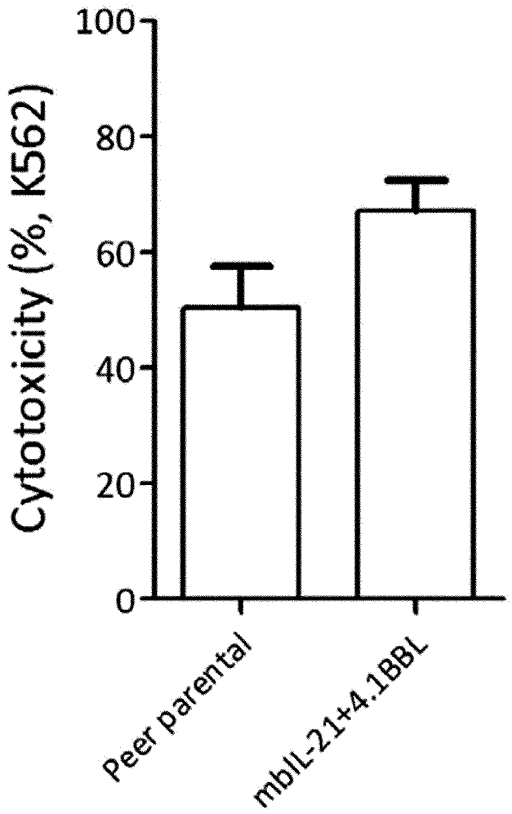
[도8b]


Cytotoxicity (%, K562)
100
80
60
40
20
0
H9 parental
mbIL-21+4.1BBL
mTNF-a+mbIL-21+4.1BBL

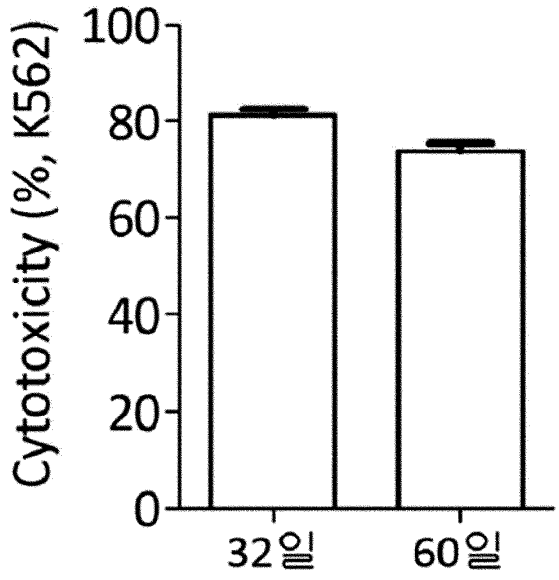
[도8c]


Cytotoxicity (%, K562)
100
80
60
40
20
0
Jurkat parental
mbIL-21+4.1BBL
mTNF-a+mbIL-21+4.1BBL

[도8d]

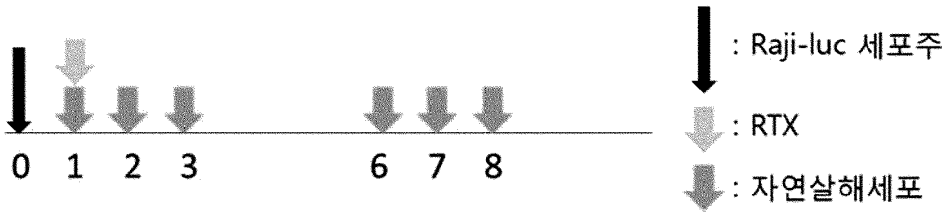

Cytotoxicity (%, K562)
100
80
60
40
20
0
Peer parental
mbIL-21+4.1BBL

[도8e]

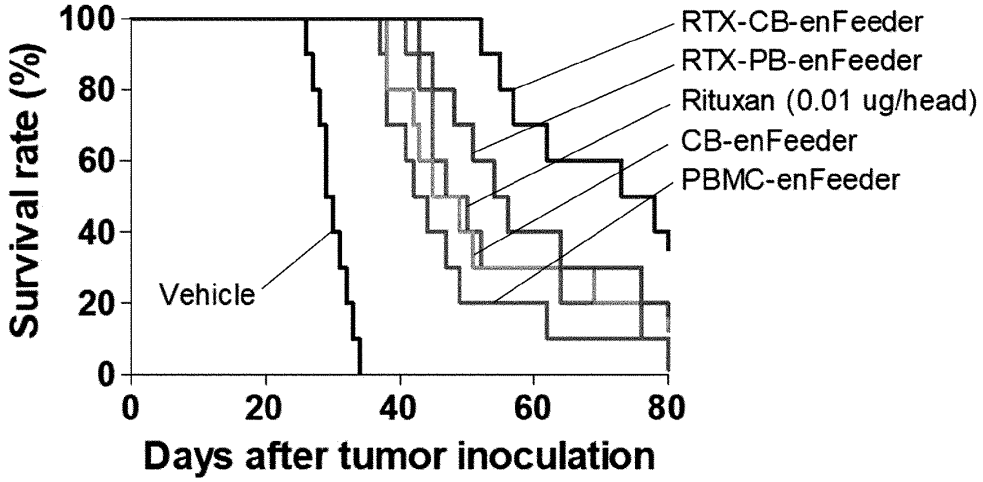

Cytotoxicity (%, K562)
100
80
60
40
20
0
32일
60일

[도9a]

동물모델: Raji (cancer cell line)

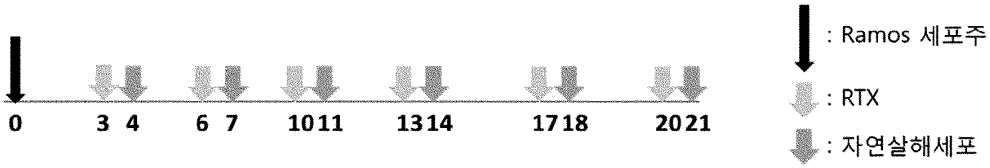


[도9b]



[도10a]

동물모델: Ramos (cancer cell line)



[도10b]

